CLAIMS

What is claimed is:

1. A hermetic reciprocating compressor, comprising:

a rotating shaft provided with an eccentric part at an upper portion thereof;

a drive unit to rotate the rotating shaft;

a frame having a shaft bore to receive the rotating shaft therein, with a first annular bearing seat formed around an upper edge of the shaft bore;

a cylinder block provided at an upper portion of the frame to define a compression chamber therein;

a piston received in the compression chamber to perform a rectilinear reciprocation in the compression chamber so as to compress a refrigerant, in response to a rotation of the eccentric part of the rotating shaft; and

a first radial bearing seated in the first annular bearing seat of the frame to sustain both axial loads of the rotating shaft and horizontal loads acting in the rotating shaft due to the rectilinear reciprocation of the piston, the first radial bearing comprising a first outer race supported by the frame and a first inner race set around the rotating shaft.

2. The hermetic reciprocating compressor according to claim 1, wherein the first radial bearing is a self-aligning radial bearing capable of allowing the rotating shaft to self-align due to a clearance angle of the first radial bearing.

3. The hermetic reciprocating compressor according to claim 1, wherein a stepped part having a reduced diameter is provided on an outer surface of the rotating shaft at a predetermined section extending downward from the first annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

4. The hermetic reciprocating compressor according to claim 3, wherein the rotating shaft in the shaft bore is supported by a lower portion of the shaft

bore.

5. The hermetic reciprocating compressor according to claim 4, wherein the rotating shaft comprises:

an oil path longitudinally formed in the rotating shaft from a lower end of the rotating shaft to the eccentric part so as to guide oil;

an oil outlet hole formed in the rotating shaft at a predetermined position where the rotating shaft is supported by the lower portion of the shaft bore, so as to feed the oil from the oil path to the lower portion of the shaft bore; and

an oil outlet port formed in the eccentric part to feed the oil from the oil path to the eccentric part.

6. The hermetic reciprocating compressor according to claim 1, wherein at least one first spring washer is provided at a position above or under the first radial bearing.

7. The hermetic reciprocating compressor according to claim 1, further comprising:

a bearing support provided on a lower surface of the eccentric part to be supported by the first inner race of the first radial bearing; and

a first spacing depression formed on a bottom surface of the first annular bearing seat, such that a lower surface of the first inner race is spaced apart from the bottom surface of the first annular bearing seat.

8. The hermetic reciprocating compressor according to claim 7, wherein the first inner race of the first radial bearing is set with friction around the rotating shaft, and the first outer race is securely fitted in the first annular bearing seat.

9. The hermetic reciprocating compressor according to claim 8, wherein a first upper spring washer having a predetermined elasticity is set in a junction between an upper surface of the first inner race and a lower surface of the bearing support.

10. The hermetic reciprocating compressor according to claim 7, wherein the first outer race of the first radial bearing is set with friction in the first annular bearing seat of the frame, and the first inner race is securely fitted over the rotating shaft.

11. The hermetic reciprocating compressor according to claim 10, wherein a first lower spring washer having a predetermined elasticity is set in a junction between a lower surface of the first outer race and the bottom surface of the first annular bearing seat.

12. The hermetic reciprocating compressor according to claim 1, further comprising:

a second annular bearing seat formed around a lower edge of the shaft bore; and

a second radial bearing seated in the second annular bearing seat, the second radial bearing comprising a second outer race supported by the frame and a second inner race set around the rotating shaft.

13. The hermetic reciprocating compressor according to claim 12, wherein the second radial bearing is a self-aligning radial bearing capable of allowing the rotating shaft to self-align due to a clearance angle of the second radial bearing.

14. The hermetic reciprocating compressor according to claim 12, wherein a stepped part having a reduced diameter is provided on an outer surface of the rotating shaft at a predetermined section extending downward from the first annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

15. The hermetic reciprocating compressor according to claim 12, wherein a stepped part having a reduced diameter is provided on an outer

surface of the rotating shaft at a predetermined section extending upward from the second annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

16. The hermetic reciprocating compressor according to claim 12, wherein the rotating shaft comprises:

an oil path longitudinally formed in the rotating shaft from a lower end of the rotating shaft to the eccentric part so as to guide oil; and

an oil outlet port formed in the eccentric part to feed the oil from the oil path to the eccentric part.

17. The hermetic reciprocating compressor according to claim 12, further comprising:

a stop ring provided around the rotating shaft to support a lower surface of the second inner race of the second radial bearing; and

a second spacing depression formed on an upper surface of the second annular bearing seat, such that an upper surface of the second inner race of the second radial bearing is spaced apart from the upper surface of the second annular bearing seat.

18. The hermetic reciprocating compressor according to claim 17, wherein a second spring washer having a predetermined elasticity is set in a junction between an upper surface of the second outer race of the second radial bearing and the upper surface of the second annular bearing seat.

19. The hermetic reciprocating compressor according to claim 17, further comprising:

a connecting rod having a shaft guide at a first end thereof to be rotatably connected at the shaft guide to an eccentric shaft formed at an upper end of the eccentric part, and connected to the piston at a second end thereof, so that the connecting rod converts an eccentric rotation of the eccentric part into the rectilinear reciprocation of the piston; and

a third radial bearing set in a junction between an outer surface of the eccentric shaft and an inner surface of the shaft guide of the connecting rod.

20. The hermetic reciprocating compressor according to claim 19, wherein the third radial bearing is a self-aligning radial bearing capable of allowing the rotating shaft to self-align due to a clearance angle of the third radial bearing.

21. The hermetic reciprocating compressor according to claim 19, wherein a stepped part having a reduced diameter is provided on an outer surface of the rotating shaft at a predetermined section extending downward from the first annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

22. The hermetic reciprocating compressor according to claim 19, wherein a stepped part having a reduced diameter is provided on an outer surface of the rotating shaft at a predetermined section extending upward from the second annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

23. The hermetic reciprocating compressor according to claim 19, wherein the rotating shaft comprises:

an oil path longitudinally formed in the rotating shaft from a lower end of the rotating shaft to the eccentric part so as to guide oil; and

an oil outlet port formed in the eccentric part to feed the oil from the oil path to the eccentric part.

24. The hermetic reciprocating compressor according to claim 1, further comprising:

a connecting rod having a shaft guide at a first end thereof to be rotatably connected at the shaft guide to an eccentric shaft formed at an upper end of the eccentric part, and connected to the piston at a second end thereof, so that the

connecting rod converts an eccentric rotation of the eccentric part into the rectilinear reciprocation of the piston; and

a third radial bearing set in a junction between an outer surface of the eccentric shaft and an inner surface of the shaft guide of the connecting rod.

25. The hermetic reciprocating compressor according to claim 24, wherein the third radial bearing is a self-aligning radial bearing capable of allowing the rotating shaft to self-align due to a clearance angle of the third radial bearing.

26. The hermetic reciprocating compressor according to claim 24, wherein a stepped part having a reduced diameter is provided on an outer surface of the rotating shaft at a predetermined section extending downward from the first annular bearing seat, so that a gap is secured between the outer surface of the rotating shaft and an inner surface of the shaft bore.

27. The hermetic reciprocating compressor according to claim 24, wherein the rotating shaft in the shaft bore is supported by a lower portion of the shaft bore.

28. The hermetic reciprocating compressor according to claim 24, wherein the rotating shaft comprises:

an oil path longitudinally formed in the rotating shaft from a lower end of the rotating shaft to the eccentric part so as to guide oil;

an oil outlet hole formed in the rotating shaft at a predetermined position where the rotating shaft is supported by the lower portion of the shaft bore, so as to feed the oil from the oil path to the lower portion of the shaft bore; and

an oil outlet port formed in the eccentric part to feed the oil from the oil path to the eccentric part.

29. A hermetic reciprocating compressor, comprising:

a rotating shaft provided with an eccentric shaft;

a drive unit to rotate the rotating shaft;

a cylinder block provided with a compression chamber therein to compress a refrigerant in the compression chamber;

a piston received in the compression chamber to perform a rectilinear reciprocation in the compression chamber so as to compress the refrigerant;

a connecting rod having a shaft guide at a first end thereof to be rotatably connected at the shaft guide to the eccentric shaft of the rotating shaft, and connected to the piston at a second end thereof, so that the connecting rod converts an eccentric rotation of the eccentric part into the rectilinear reciprocation of the piston; and

a third radial bearing set in a junction between an outer surface of the eccentric shaft and an inner surface of the shaft guide of the connecting rod.

30. The hermetic reciprocating compressor according to claim 29, wherein the third radial bearing is a self-aligning radial bearing capable of allowing the rotating shaft to self-align due to a clearance angle of the third radial bearing.